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| 09 865,197 | 05 24 2001 | Manabu Hanakawa | 9319S-000214 | 2018 |

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EXAMINER

DI GRAZIO, JEANNE A

| ART UNIT | PAPER NUMBER |
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2871

DATE MAILED: 11 20 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/865 197

Examiner

Jeanne A. Di Grazio

Applicant(s)

HANAKAWA ET AL

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

DETAILED ACTION

LIQUID CRYSTAL DEVICE, METHOD FOR MAKING THE SAME, AND ELECTRONIC APPARATUS

Priority

Priority to Japanese Patent Applications Nos. 2000-154697(P) and 2000-154699(P) is claimed for May 25, 2000.

Specification

The lengthy specification (68 pages including abstract and claims) has not been checked to the extent necessary to determine the presence of all possible minor errors. *Applicant's cooperation is requested* in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claim 16 is objected to because of the following informality: Please insert a space between "deviceincluding." Appropriate correction is required.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 2-5, 7-15, 20, and 21 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 4, 5, 11, 13, 14, 15, and 21 of copending Application No. 09/865,046 in view of Nakai et al. (USPN 6,144,429). This is a provisional obviousness-type double patenting rejection.

2. The liquid crystal device according to claim 1, further comprising a first lead provided on the first substrate, wherein the first lead has a metal film, and the average diameter of the crystal grains in the metal film is larger than that of

reflective film which is provided on the first substrate and contains metal; a first transparent electrode deposited on the reflective film; and a lead provided on the first substrate, wherein the lead comprises a metal film, and the average diameter of the crystal grains in the metal film is larger than that of the crystal grains in the reflective film.

Discussion (claims 2 and 20): Claim 5 of '046 discloses a first lead having a metal film. '046 does not appear to have crystal grains in either a metal film or a reflective film; however, Nakai et al. teaches that metal film crystal grains grow by the application of heat [Col. 6, Lines 18-20]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include crystal grains of a metal film being larger than those of a reflective film for the purpose of controlling reflectance and light scattering ability [Nakai et al., Col. 6, Lines 16-18].

3. The liquid crystal device according to claim 2, wherein the average diameter of the crystal grains in the reflective film is in the range of 0.1 nm to 6.0 nm, and the average diameter of the crystal grains in the metal film is in the range of 2.0 nm to 20 nm.

Discussion: Nakai et al. has reflecting electrodes with titanium oxide particles of an average particle size of 0.7 micrometers [Col. 5, Line 45, referring to Figure 7]. Nakai et al. also has particles of titanium oxide dispersed in an acrylic resin with a particle size in a range of 0.3 to 1.5 micrometers [Col. 7, Lines 56-59]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '046 in view of Nakai et al. to maintain particle sizes in a given range such that a satisfactory scattering performance could be obtained [Nakai et al., Col. 7, Lines 54-55].

4. The liquid crystal device according to claim 2, wherein the metal film is provided on the reflective film.

Discussion: See '046 claim 1.

5. The liquid crystal device according to claim 2, wherein the first lead further comprises a metal oxide film deposited on the metal film.

Discussion: See '046 claim 5.

7. The liquid crystal device according to claim 6, wherein the metal film is formed at a portion other than the connection to the driver IC.

Discussion: See claim 15 of '046.

8. The liquid crystal device according to claim 2, further comprising: a second lead provided on the first substrate; and a driver IC for driving the liquid crystal, wherein the second lead comprises a metal film, and an input signal is supplied to the driver IC through the second lead.

9. The liquid crystal device according to claim 8, wherein the metal film is formed at a portion other than the connection to the driver IC.

Discussion: *046 claim 15.

10. The liquid crystal device according to claim 8, further comprising an external circuit board for supplying the input signal to the driver IC, wherein the external circuit board is connected to the second lead, and the metal film is formed at a portion other than the connection to the external circuit board.

Discussion: See *046 claim 13.

11. The liquid crystal device according to claim 1, further comprising: a first lead connected to the first transparent electrode; and a driver IC connected to the first lead, wherein the first lead comprises a metal film.

Discussion: See *046 claim 14.

12. The liquid crystal device according to claim 11, wherein the metal film is formed at a portion other than the connection to the driver IC.

Discussion: See *046 claim 15.

13. The liquid crystal device according to claim 11, further comprising: a second lead provided on the first substrate, wherein the second lead comprises a metal film, and an input signal is supplied to the driver IC through the second lead.

Discussion: See *046 claim 11.

14. The liquid crystal device according to claim 13, further comprising: an external circuit board supplying an input signal to the second lead, wherein the metal film of the second lead is formed at a portion other than the connection to the external circuit board.

Discussion: See *046 claim 14.

15. An electronic apparatus comprising a liquid crystal device according to claim 1.

Discussion: See *046 claim 4.

21. The liquid crystal device according to claim 20, further comprising: a first extending region which is provided

provided at a side crossing said one side of the first substrate and which does not overlap the second substrate, wherein the lead is provided over the first extending region and the second extending region.

Discussion: See '046 claim 21.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakai et al. (USPN 6,144,429) in view of Katsuya et al. (USPN 6,081,310).

Per claim 1:

1. A liquid crystal device including a first substrate and a second substrate opposing each other and a liquid crystal enclosed in a gap between the first substrate and the second substrate, the liquid crystal device comprising: a reflective film which is provided on the first substrate and contains silver; a protective film provided on the reflective film; a first transparent electrode provided on the protective film; and an alignment film provided on the first transparent electrode.

Discussion: Nakai et al. does not appear to specifically have a protective film; however, Nakai et al. does have a light scattering layer on a reflective film [Figure 11]. Nakai et al. does not appear to have a reflective film containing silver; however, Katsuya et al. has an upper electrode layer made of silver or a silver alloy and the layer is reflective [Col. 3, Lines 44-46]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakai et al. in view of Katsuya to include the reflective layer of silver because silver has a higher reflectance than aluminum [Katsuya et al., Col. 3, Lines 7-8]. Silver is also widely used in the art. Though Figure 11 of Nakai et al. addresses a similar structure to that of Applicant's claim 1, Nakai et al. does not appear to have an alignment film. However, the use of an alignment film to affect liquid crystal alignment is widely known in the art of LC devices [For example, see Okumura, USPN 6,008,871, discussing other elements essential to LC technology such as liquid crystal orientation film at Col. 6, Lines 33-35].

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakai et al. (USPN 6,144,429) in view of Sakamoto et al. (USPN 6,366,331 B1).

6. The liquid crystal device according to claim 2, further comprising: a second transparent electrode provided on the second substrate; and a driver IC for supplying output signals to the first lead, wherein the first lead is connected to the second transparent electrode with a conductor.

Discussion: Nakai et al. does not appear to have a driver IC; however, a driver IC is often an essential element in liquid crystal technology [See, e.g., Okumura (USPN 6,008,871) Col. 6, Lines 33-38]. Nakai et al. does not appear to have a conductor; however, Sakamoto et al. does have conductive particles on upper transparent electrodes [ABS.] It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Nakai et al. in view of Sakamoto et al. for satisfactory contact between a terminal and a TAB [Col. 3, Lines 48-49, Sakamoto et al.].

Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakai et al. (USPN 6,144,429).

Per claims 16-18:

16. A liquid crystal device including a first substrate and a second substrate opposing each other and a liquid crystal enclosed in a gap between the first substrate and the second substrate; the liquid crystal device comprising: a reflective film which is provided on the first substrate and contains silver; and a protective film provided on the reflective film, wherein the reflectance of the protective film for light at a shorter wavelength end of visible light is higher than that for light at a longer wavelength end.

17. The liquid crystal device according to claim 16, wherein the protective film contains titanium oxide.

18. The liquid crystal device according to claim 17, wherein the protective film has a refractive index of 1.8 or more.

Nakai et al. does not appear to have a protective layer of a given reflectance, composition, and refractive index; however, Nakai et al. does have a light scattering layer containing light scattering particles in a transparent resin [Col. 2, Lines 26-29]. The particles are preferably made of, inter alia, titanium oxide [Col. 3, Lines 16-17]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select a protective film of a given reflectance and refractive index such that the light scattering effect can be controlled [Col. 3, Lines 35-37 of Nakai et al.] and such that one could easily obtain a diffused reflector that allows easy scattering control and improved whiteness [Id. at Lines 37-39]. A reflective film of silver has been previously addressed.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (USPN 6,147,728).

Per claim 19:

reflective film which is provided on the first substrate and contains silver; first transparent electrodes provided on the reflective film; and second transparent electrodes provided on the second substrate; wherein dots are formed corresponding to crossings of the first transparent electrodes and the second transparent electrodes, a plurality of the dots defining one pixel, different color layers are assigned to the dots defining said one pixel, the color layers containing a blue color layer and a red color layer, and the distance from a white coordinate point to a coordinate point of the light which passes through the blue color layer is larger than the distance from the white coordinate point to the coordinate point of the light which passes through the red color layer in an xy chromaticity diagram.

Discussion: Okumura et al. has a reflective film of silver [Col. 26, Line 38]. Okumura et al. has transparent electrodes [Col. 28, Lines 57-58]. Okumura et al. has dots formed of intersecting pixel electrodes (made of transparent ITO) and opposing electrodes (made of transparent ITO) [FIG. 15]. A plurality of dots defines a pixel. Okumura et al. does not appear to have red and blue filters in the embodiment of Figure 15; however, Okumura et al. has red and cyan filters [Figure 15] and other filters such as red, green, and blue in other embodiments. Okumura et al. does not appear to specify a distance from a white coordinate point to coordinate points from blue and red color layers; however, Okumura et al. has numerous examples of transmissivity in the context of the color filters. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Okumura et al. to have a specified distance from respective coordinate points to affect transmissivity among various color filters.

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakai et al. (USPN 6,144,429) in view of Katsuya et al. (USPN 6,081,310).

Per claims 22-23:

22. A method for making a liquid crystal device including a first substrate and a second substrate opposing each other and a liquid crystal enclosed in a gap between the first substrate and the second substrate, the method comprising the steps of: providing a reflective film containing silver on the first substrate; providing a protective film on the reflective film; providing a first transparent electrode on the protective film; and providing an alignment film on the first transparent electrode.

23. The method for making a liquid crystal device according to claim 22, further comprising the step of: providing a first lead having a metal film on the first substrate, wherein the average diameter of the crystal grains in the metal film is larger than that of the crystal grains in the reflective film.

Discussion: Please refer to the previous analysis concerning claims 1 and 2. While Nakai et al. and Katsuya et al. do not appear to specifically disclose method steps, said methods are essentially disclosed in the cited teachings.

Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakai et al. (USPN 6,144,429).

Art Unit: 2871

24. A method for making a liquid crystal device including a first substrate and a second substrate opposing each other and a liquid crystal enclosed in a gap between the first substrate and the second substrate, the method comprising the steps of: providing a reflective film containing silver on the first substrate; and providing a protective film on the reflective film; wherein the reflectance for light at a shorter wavelength end in visible light of the protective film is higher than that for light at a longer wavelength end.

25. The method for making a liquid crystal device according to claim 24, wherein the protective film contains titanium oxide.

26. The method for making a liquid crystal device according to claim 25, wherein the protective film has a refractive index of 1.8 or more.

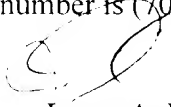
Discussion: Please refer to the previous analysis as addressed in claims 16-18.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (703)305-7009. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703)305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-8741 for regular communications and (703)746-8741 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Jeanne Andrea Di Grazio


James A. Dudek, Primary Examiner

JDG

November 13, 2002